User manual
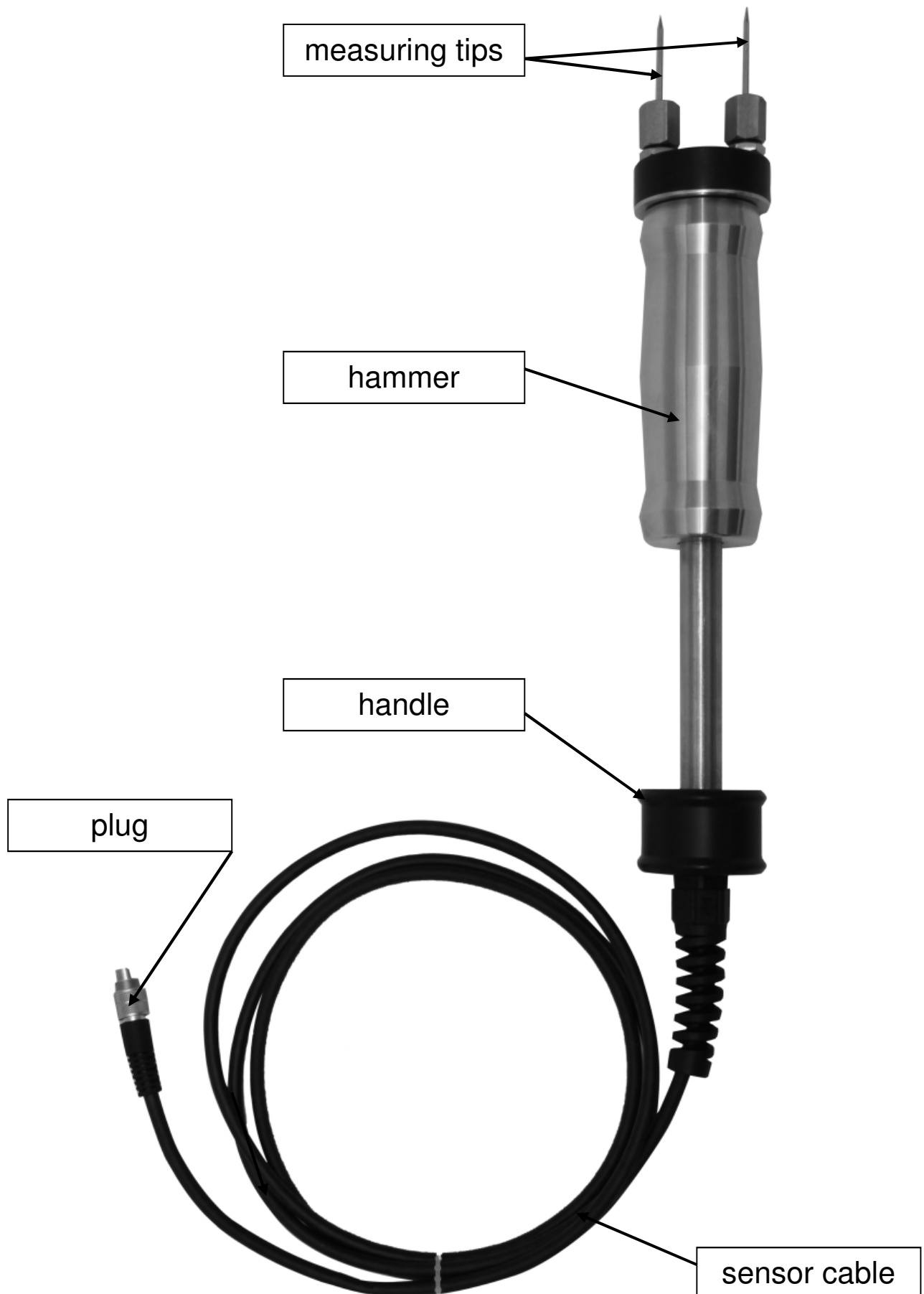

Universal moisture meter for biomass
humimeter BL2

Design BL2 hammer (art.no. 12520)

measuring tips

hammer

handle

plug

sensor cable

humimeter.com

Measuring procedure BL2 hammer

1. For a correct measurement please ensure that the device has the same temperature than the wood (+/-3℃). For that reason, let your humimeter BL2 hammer adjust to the surrounding temperature of the material for at least half an hour before measuring.

2. Switch on the device: Press the ⏻ **key for three seconds.**

3. Choose a part of the wood, **WITHOUT bark, branches**, **pitch pockets or cracks** and drive the ram electrode in the right angle to the grain into the wood. Hold the top of the electrode with one hand, take the handhold with the other hand and push down the handhold with active force. Drive the nails about 2 cm deep into the wood. **Attention: Risk of injury!!!**

4. Plug in the sensor cable into the socket of the BL2. Take care of the correct position and fix it with the knurled nut.

5. Change the calibration curve: Press one time the ⬗ key and then the ▲ or ▼ key. The name of the calibration curve can be seen at the head of the display.

6. **Now the display shows the water content.** Left hand the temperature is displayed.

7. To save the results in the save menu press the ⊟ (▲ button). The storage was successful when the number in front of the symbol ⊟ increased. To reach the store menu please press (⬗) until the ⊟ appears.

8. To name the saved results press the ✎ button.

9. Push out the ram electrode of the wood with caution.
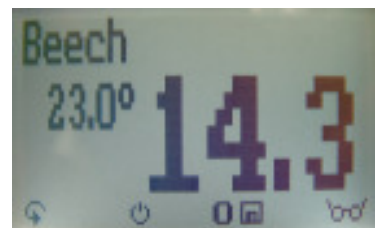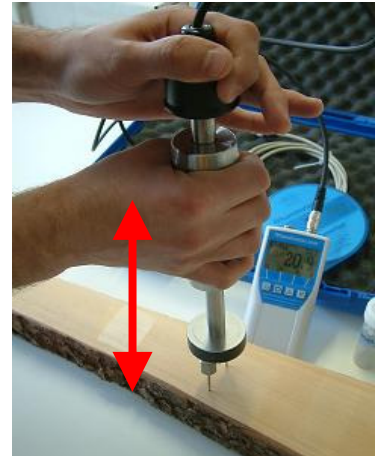
Informations for measurement with BL2 hammer

- With the standard nails the wettest part over the whole measuring depth will be measured. If you need the water content in a defined measuring depth, you should use the isolated green nails (article number 11426), because they are only measuring at the points.

- Important: You have to remove the bark before you can start to measure.

- The measuring depth should be a quarter of the wood diameter. In the worst case you have to cut away a part of the diameter.

- Statistically, the spot that shows best the average moisture of the wood is at about 20% of the total wood length.

- Take a few logs on different positions of each piece of wood you intend to measure, and the humimeter BL2 will calculate automatically the average value of the series.

- The measure value which is shown at the display of your humimeter BL2, represents the "water content" of the wood. So there is no conversion form the "wood moisture" into "water content" for use. It is also possible to change the value into "wood moisture". If you need this, contact support@humimeter.com

- Definition water content:

  The water content is declared as the amount of water in a wood, which stands in relationship to the whole weight of the wood. For example: You have 1kg Wood with 40% water content; the wood consist of 0,4kg water and 0,6kg wood.

- Definition wood moisture:

  The wood moisture is declared as the amount of water in a wood, which stands in relationship to the weight of the dried wood. The same example: You have 0,6kg Wood with 0,4kg water; the 0,6kg wood represents 100%, so the 0,4kg water will be 66,7% wood moisture.

Sorts (calibration curves) BL2 hammer

Main Group	Sub groups							
Beech	Rubber							
Oak	Mahogany	Wenge						
Alder	Acacia	Alstonia	Birch	European chestnut	Horse chestnut	Cherry Tree	Walnut	Okan
Ash	Keruing							
Spruce								
Pine	Balsa	Yew Tree	Stone Pine					
Larch	Maple	Douglas Fir	Hemlock	Cotton Wood	Elm			
Fir	Ceiba	Linden						
Willow	Pear	Hickory	Olive wood	Ramin	Teak			
Straw	Only for use with the tip set for straw-bales (article no. 12521) max. compression density: 100 to 130kg/m³							
Hay	Only for use with the tip set for straw-bales (article no. 12521) max. compression density: 100 to 130kg/m³							
Cellulose	Only for use with the tip set for straw-bales (article no. 12521) max. compression density: 38 to 65kg/m³							
Digit 1	For special products							
Empty 1	For special calibration, realized by company Schaller GmbH							
Test block	Only for checking the calibration with the test block							

Declaration: The main group of wood is the wood sort, which is shown on the measurement display of your humimeter BL2. Do you want to measure wood, which is not in the list of the main group, you should search it at the sub groups in the table above. Then use the wood of the main group for the measuring. For example: If you want to measure "Cherry Tree", you have to choose the "Alder" wood at you device.

Valid measuring Range

Beech	32%
Oak	32%
Alder	40%
Ash	35%
Spruce	40%
Pine	35%
Larch	32%
Fir	37%
Willow	40%

If the measure value is grey, the standard valid measuring range is exceeded (limits see Table). In this case the accuracy will be decreasing.

A blinking measuring value shows you the upper end of the measuring range.

Design BL2 wood chips probe (art. no. 12518)

Measuring head

Insertion probe

Handle

Plug

Sensor cable
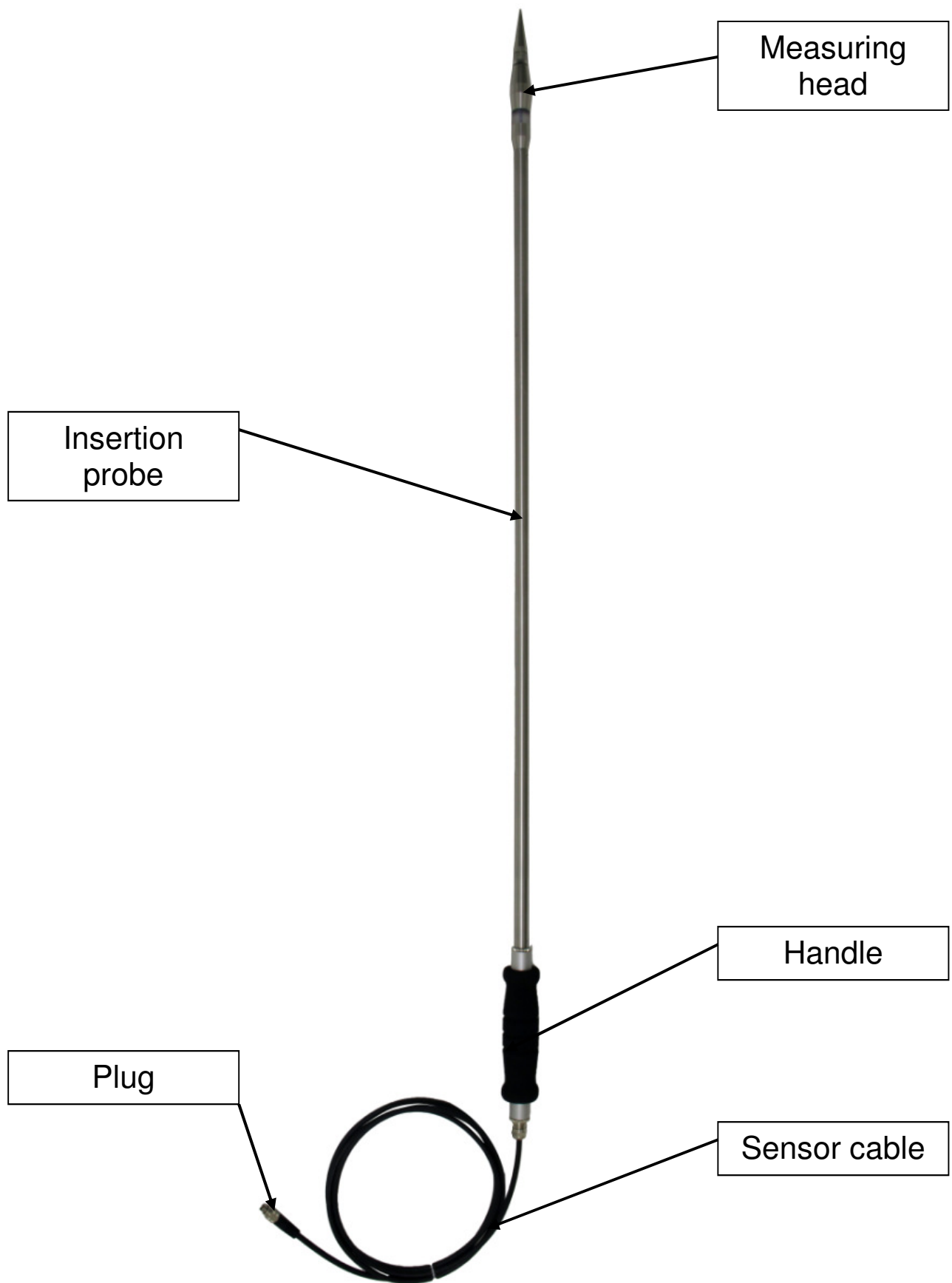
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Measuring procedure BL2 wood chips probe

1. For a correct measurement please ensure that the device has the same temperature than the wood chips (+/-3℃). For that reason, let your humimeter BL2 adjust to the surrounding temperature of the material for at least half an hour before measuring.

2. Switch on the device: Press the ⏻ **key for three seconds.**

3. Plug the probe of your BL2 wood chips probe **straight into the wood chips.** It is not allowed to load the measuring head incorrect or drop it down!

4. Plug in the sensor cable into the socket of the BL2. Take care of the correct position and fix it with the knurled nut.

5. Change the calibration curve: Press one time the ⊕ key and then the ▲ or ▼ key. The name of the calibration curve can be seen at the head of the display.

6. **Now the display shows the water content.** Left hand the temperature is displayed.

7. To save the results in the save menu press the ▣ (▲ button). The storage was successful when the number in front of the symbol ▣ increased. To reach the store menu please press (⊕) until the ▣ appears.

8. To name the saved results press the ✐ button.

9. Remove the BL2 probe straight with caution and clean the measuring head. **Risk of injury by measuring head! Keep away from children!**

Calibration curves BL2 wood chips probe

Calibration curves	Declaration	Measuring range
Wood chips	Standard wood chips	10 - 50 %
Coarse chips	Coarse wood chips	10 - 50 %
Industrial chips	Industrial wood chips	10 - 50 %
Pellets	Pellets made of wood	11 - 20 %
Sawdust	Sawdust	14 - 50 %
Olive stones	Shredded olive stones	10 - 21 %
Digit 2	For special product	
Empty 2	Customer calibration made by Schaller GmbH	
Test block	*! Only for testing the BL2 with the test block !*	

➢ **Wood chips:** standard chips of wood (forest wood chips) according to standard EN 14961 class **P16, P31.5** and **P45**.

➢ **Coarse chips:** for coarse wood chips **P45 or P31.5 but with fewer fines.**

➢ **Industrial chips:** for industrial chips of wood **without barks and fines** (similar **P45** or **P63**)

Definition of wood chips classes
The stated numbers refer to the particle size that goes through round gaps of the corresponding diametres (e.g. P16: 16 mm).
o **P16**   minimum 75% of the bulk is between 3.15 and 16 mm
o **P31,5** minimum 75% of the bulk is between 8 and 31.5 mm
o **P45**   minimum 75% of the bulk is between 8 and 45 mm
o **P63**   minimum 75% of the bulk is between 8 and 63 mm

Compression of wood chips

The humimeter BLL is calibrated for normally compressed wood chips. If the measured wood chips are compressed to a much lesser or greater extent, this will cause measuring imprecisions. Normally compressed wood chips are defined in norm EN 15103 (determination of the bulk density).

Determination of the material reference moisture

The principle is a comparison measurement with the dehydration method according to EN 14774. Take the measured sample and weigh it. Dry it out in an oven and weigh it again.

$$\%F = \frac{Mn - Mt}{Mn} \times 100$$

M_n: Mass with average moisture content
M_t :   Mass of the dried sample
%F: Calculated absolute moisture

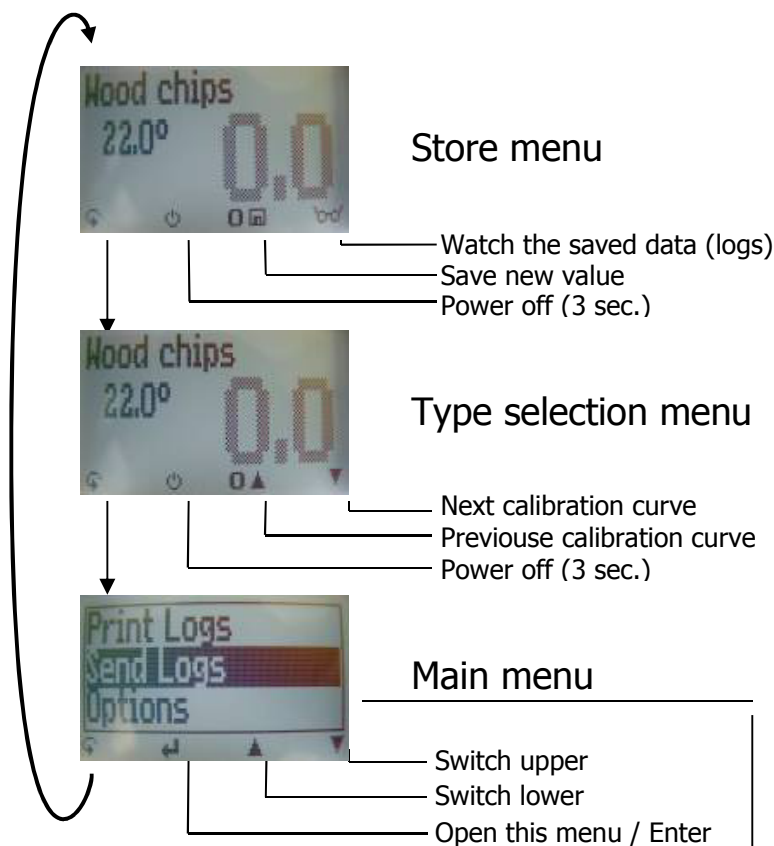# Pictures of different types of wood chips for determination of correct calibration curve

Woodchips

Coarse ch.

Industr. WC

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Menu level overview

Store menu

— Watch the saved data (logs)
— Save new value
— Power off (3 sec.)

Type selection menu

— Next calibration curve
— Previouse calibration curve
— Power off (3 sec.)

Main menu

— Switch upper
— Switch lower
— Open this menu / Enter

Overview main menu

Edit Logs	Options
Manual Logs	Date / Time
Clear Logs	Log Time
	Language
Print Logs	Unlock
Last Log	℃ / ℉
All Logs	o Userlevel
Clear Logs	BL On Time
	Auto Off Time
Send Logs	Materialcalib.
Manual Logs	Password
Clear Logs	Reset
Options	
Status	

Keypad symbols

Measuring window:

🔁	Rolling Menu
⏻	Power ON / OFF
▲	Switch upper
▼	Switch lower
🖫	Save
⎕	Hold
👓	Watch the saved data
✎	Suppliers data can be added
↻	Rotate display

Menu:

↵	Enter
▲	Switch upper
▼	Switch lower
⎗	Exit
0..9	Enter numbers
A..Z	Enter letters
➤	Next or right
◄	Left
✓	Yes
✗	No
⇧	Shift
OK	OK

Changing batteries

Please find enclosed the manual for changing of batteries:

1.) At first remove the rubber protective housing. For that, hold the rubber housing at the upper side and pull it over. If your BL2 is provided with an optional USB port, you have to remove the protection cap before.

2.) Press with your finger onto the arrow of the battery cap und pull it back.

3.) Remove the empty batteries.

4.) Put four new batteries in the device. Make sure that the position of the battery poles is correct.

5.) Press down the batteries and close the cap.

If the battery symbol appears in the measuring window resp. if a critical charge of battery is shown in the status, the batteries have to be changed IMMEDIATELY. If you do not use your humimeter device for a longer period, remove the batteries. For eventual resulting damages we cannot provide any warranty.

Running the instrument

Switch on:	Press the ⏻ key for three seconds
Set the clock:	Press three times the ✛ key -> Options -> Date/Time
Save measuring value:	Save the measuring value by pressing the button below the ▣ symbol. The storage was successful when the number in front of the symbol ▣ increased. To name the saved results press the ✎ button.
Hold measuring value:	At first activate the function in the menu Options -> Datalog time by choosing "Hold". Then press the left key until ⊞ appears. Press the ⊞ key. The measuring value remains on the display until another button is pressed.
Display lighting:	Press the ⏻ key; Backlight will turn off automatically after 30 seconds. Backlight will be activated by pressing any key.
Power off:	Press the ⏻ key for five seconds; the device will be switched off when you leave the key. The device also switches off automatically when no key is pressed for four minutes.
Measuring range limit:	If the measuring value is blinking, the valid measuring range is exceeded. In this case the accuracy will be decreasing.

List of calibration curves

Pressing the ▲ or ▼ key in the measuring for at least three seconds and a list with all available sorts will appear. Select your sort by pressing ▲ or ▼ and confirm it with the ↵ key. The measurement will continue automatically.

Activation of the "super user" function

Two times ⊕ - *Options* – Unlock

Enter the 4-digit password by using the ▲ button (standard is the 4-digit serial number) and confirm by pressing the ↵ button.

Changing the Userlevel

Changing from advanced user to single user:

Make sure that you have activated the "super user" functions according to the instructions above. Afterwards change to the menu and choose „Options".

In the submenu please select „o Userlevel" (two times ⊕ - *Options* – o *Userlevel)*

Confirm by pressing the ↵ button. Now the single user is activated.

Changing from single user to advanced user:

Keep both the buttons ▲ and ▼ pressed directly after switching on the device. Your humimeter automatically starts the main menu. Activate the the "super user" functions according to the instructions above.

Navigate to "*Options* – o *Userlevel"* and confirm by pressing the ↵ button.

Device maintenance instructions

To provide a long life of your device please does not expose it to strong mechanical loads or heat e.g. dropping it or direct sunlight exposure. Clean your device using a dry cloth. Any kind of wet cleaning damages the device.

It is not allowed to load the measuring head incorrect (stress, bending), otherwise it can be broken. Plug and remove the insertion probe of your BL2 straight into the wood chips.

The instrument is not rainproof. Keep it in dry areas. When the device isn't used for a longer period (2 months) or when the batteries are empty, they should be removed to prevent a leakage of the battery acid.

Transfer saved data to the PC

(Only possible with humimeter USB interface module)

To send your saved logs to the PC, connect the humimeter device to your PC using the USB cable that was delivered with your device. Carefully loose the protection cap on your humimeter and plug in the USB mini B connector. The bigger connector has to be connected to a USB slot on your PC.
Start the LogMemorizer software on your PC and switch on your humimeter BL2.

The data transfer can be started on your humimeter or on the software.

Starting the data transfer on the humimeter:

Press the ↻ key until you reach the menu (see image on the right). Then choose „Send Logs" and confirm by pressing the ↵ key. Now choose „Manual Logs" and confirm with ↵ again. All saved logs will be sent to your PC.

Starting the data transfer on your PC:

Press the button „remote control" in the LogMemorizer software. A drop-down menu with several options opens (see image below).

For transferring the data you can select „Import last manual log" (the last saved measuring series is transferred) or „Import all manual logs" (all saved logs are transferred).

If you click on one of these menu items, the transfer starts immediately.

For the basic adjustments of the software please look through the instructions on the LogMemorizer CD.
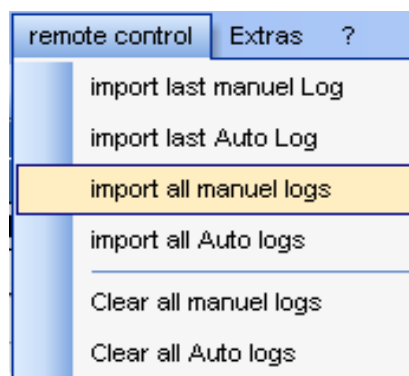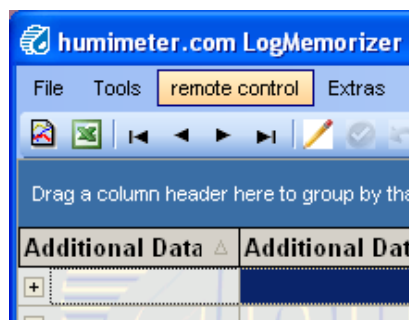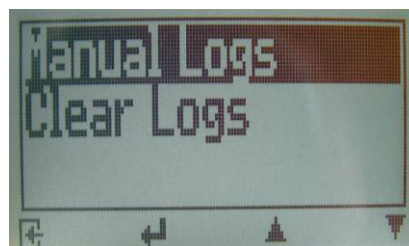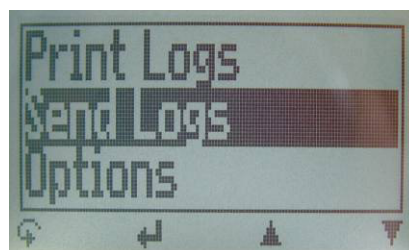
Print saved data

(Only possible with humimeter USB interface module in combination with Schaller thermo printer)

To print your saved data, connect the device to the printer using the printer cable that was delivered with your device. Carefully loose the protection cap on the humimeter BL2. At first plug in the side of the connector with the close plastic casing at the humimeter BL2. Then switch on the device.

Not till then the other side of the cable has to be plugged in at the printer. Switch on the printer by pressing ⏻. Now the green LED is blinking. If it does not blink, please change the batteries and try again.

Press the ⭥ button at your humimeter until you reach the menu (see image on the right). Choose „Print Logs" and confirm by pressing ↵.

Now you can select if you want to print the last saved measuring series or all saved measuring series (logs).

Confirm by pressing ↵ again. The selected logs are printed out now.

To save paper, please think of clearing the data storage regularly*.*
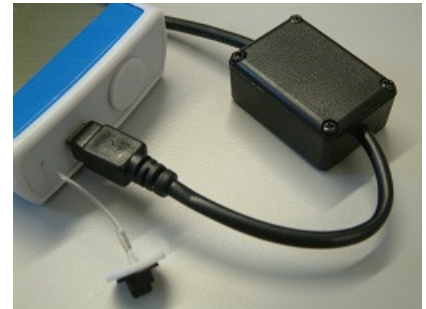
Technical data BL2 (Art. Nr. 12109)

Operation temperature	0 °C to +50 °C
Storage temperature	-20 °C to +60 °C
Temperature compensation	Automatically
Data logger	approximately 10.000 values
Menu languages	German, English, French, Italian, Spanish, Russian
Power supply	4 pcs. 1.5 Volt AA <u>Alkaline</u> batteries (900 measurements)
Auto Switch off	After approx. four minutes
Current consumption	60mA (with light)
Display	128 x 64 matrix display, lighted
Dimension	150 x 75 x 30 mm
Weight	270 g (with batteries)
Protection class	IP 40
Scope of supply	humimeter BL2, 4 x 1,5Volt AA Alkaline batteries, rubber protective housing
Optionen	wooden case for BL2, test block, humimeter USB-data interface modul, portable thermo-printer

Exemption from liability

For miss-readings and wrong measurements and of this resulting damage we refuse any liability. This is a device for quick determination of moisture. The moisture depends on multiple conditions and multiple materials. Therefore we recommend a plausibility check of the measuring results. Each device includes a serial number and the guarantee stamp. If those are broken, no claims for guarantee can be made. In case of a faulty device, please contact Schaller GmbH (www.humimeter.com) or our dealer.

Technical data BL2 wood chips probe (art. no. 12518)

Resolution of display	0.5% water content 0.5 °C temperature
Measuring range	10% to 50% water content
Operation temperature	0 °C to +40 °C
Temperature measuring range	-10 °C to +80 °C
Dimension	1150 x 35 x 35 mm
Weight	710 g
Protection class	IP 40

Technical data BL2 hammer (art. no. 12520)

Resolution of display	0.1% water content 0.5 °C temperature
Measuring range	8% to 60% water content
Operation temperature	0 °C to +50 °C
Temperature measuring range	-10 °C to +60 °C
Dimension	360 x 45 x 45 mm
Weight	1500 g
Protection class	IP 40
Option	Replacement tips 60mm insulated, measuring tips set 255mm for bales of hay- and straw (art. no. 12521)

Measuring tips set 255mm for bales of hay- and straw

Most common reasons for miss readings with BL2 hammer

- ***Product temperature out of application range***
  Material below 0℃ resp. above +50℃ (32 to 122 ℉) may cause faulty measurements.

- ***Temperature difference between meter and sample***
  Please ensure that the device and the material under test are being stored at the same temperature (+/-3℃) before measuring. A high temperature difference has a negative effect on the stability of the measurement results.

- ***Wrong calibration curve***
  Before you measure your sample, double check the correct selection of the calibration curve.

- ***Frozen wood or beetle infested wood***
  If you measure such products, the accuracy will decrease.

- ***Measurement through bark***
  In fact of that the accuracy will decrease.

- ***Direct solar radiation***

Most common reasons for miss readings with BL2 wood chips probe

- ***Product temperature out of application range***
  Material below 0℃ resp. above +40℃ (32 to 104 ℉) may cause faulty measurements.

- ***Temperature difference between meter and sample***
  Please ensure that the device and the material under test are being stored at the same temperature (+/-3℃) before measuring. A high temperature difference has a negative effect on the stability of the measurement results.

- ***Wrong calibration curve***
  Before you measure your sample, double check the correct selection of the calibration curve.

- ***Wet or mouldy material***

- ***Frozen wood chips***
  If you measure such products, the accuracy will decrease.

- ***Water film at the measuring head***
  After measuring wet material a water film can arise on the sensor head. This could lead to a too high result in the following measurement. After measuring wet material clean both black plastic parts accurately with a dry cloth.

It is not allowed to load the measuring head incorrect (stress, bending), other wise it can be broken. Plug and remove the insertion probe of your BL2 wood chips probe straight into the wood chips.

Do not move the BL2 probe crosswise to the insertion direction after plugging in.

Do not drop the measuring head or use it for any ulterior purposes.

A broken measuring head is no case of warranty!